

MANAGEMENT PROBLEMS AND OPPORTUNITIES

Management Activities

Fish Introductions

To date, no attempt has been made to introduce exotic species or augment native populations through fish stocking. The possibility of transplanting endangered central mudminnows from Goose Pond to suitable locations in the basin has been discussed, but no formal plans have been written.

Sport Fishing/Harvest Regulations

Statewide creel and size limits are in effect.

Strategic Plan for the Fox River Basin

The following planning portion of this document is structured around the fundamental premise that there are three basic components to any fishery: 1) the habitat, which by definition includes water quality; 2) the aquatic biota, which include sport fish; and 3) recreational use and other interactions among people, habitat, and biota. The plan includes only the desired outcomes and actions which district staff of the Fisheries Management Section of the Missouri Department of Conservation can reasonably expect to achieve or influence during the next 25 years. The goals are of equal importance, but objectives and tasks are listed in priority order whenever possible.

GOAL I: Improve aquatic habitat conditions in the Fox River Basin so that all life stages of native fish species may thrive.

Perspective: In 1987, average Stream Habitat Assessment Device (SHAD) scores in three physiographic regions ranged between .68 and .73, indicating borderline stream habitat degradation throughout the basin. Approximately 20% of basin stream mileage was channelized. While the Fox River itself was virtually unaltered, the Little Fox River, Sugar Creek, and Honey Creek were channelized extensively (28-49%). Sedimentation is the only significant form of water pollution in the basin, but it threatens the integrity of the entire stream ecosystem. The Soil Conservation Service (1978) estimated that sediment delivery to the Fox and Wyaconda rivers averaged 3 tons/acre/year from the 483,780 acres which comprise the combined watersheds; this ranked ninth among 45 Missouri subbasins in rate of sediment delivery to stream channels. This sediment load equates to dumping 100,000 large truck loads of earth fill into these streams annually.

We have documented a reduction in Fox River base flow between the periods 1922-1952 and 1953-1980. A 90:10 ratio of 1:245 further indicates "flashy" streamflow. These hydrological problems are most probably tied to land use practices which have diminished the moisture retention capacity of basin soils. These net adverse effects have been measurable despite a 5.8%

increase in basin timber between 1939 and 1984, indicating that type of vegetative cover along may not have as significant an effect on basin hydrology as the manner in which cover types are managed. From the 1950s through the 1980s, an increasing dependence on monoculture, heavy machinery and chemical methods for producing crops has compacted the soil and reduced its organic matter content, thereby reducing its capacity to retain moisture.

The largely agricultural population of Clark County is generally unaware of the adverse effects that channelization, levee construction, riparian corridor clearing, and high-input agriculture have had on basin streams. Most are also in a poor position financially to act favorably upon any sense of stream stewardship which they may possess. It may be possible during the next 25 years to provide enough information and inspiration to begin reversing the trend toward stream habitat degradation, but it will require frequent interaction with school-age children, influential landowners, and the media. It will also require that aquatic resource managers acquire a working knowledge of the concepts and techniques of low-input sustainable agriculture. Significant change cannot occur without widespread adoption of this technology by basin landowners.

Objective 1.1: No additional channelization projects or levee construction projects which may damage basin stream channels.

Strategy: Preventing stream channel destruction will require a combination of watchdog activity in order to facilitate enforcement of current laws and education in order to build a consensus in thinking that will minimize the need for law enforcement action. To accomplish this, we should:

- * Bring unpermitted wetland fill projects to the attention of the U.S. Army Corps of Engineers and comment on all basin applications for wetland fill projects which fall under the jurisdiction of Section 404 of the Clean Water Act.
- * Make classroom presentations on stream conservation to Clark County sixth graders, including demonstration of the artificial stream whenever possible.
- * Prepare news releases for the Kahoka newspaper, "The Media," which describe problems associated with channelization and levee construction projects.

Objective 1.2: Stream Corridor Plans developed and implemented as part of Area Plans for Charlie Heath SF and Fox Valley SF.

Strategy: The time of completion of Stream Corridor Plans will depend upon inter-divisional priorities for planning Department of Conservation areas. Even though streambank erosion and riparian corridor problems on these areas are not serious or widespread, implementation of Stream Corridor Plans, once written, should proceed with relative dispatch. To start the process, we should:

- * Participate in area planning committees at time of formation by the managing MDC division.
- * Ensure that Stream Corridor Plans include restoration of badly eroded streambanks and conservation of wooded corridors which extend at least 100 feet from the top of banks on all order-3-and-larger streams.

Objective 1.3: A majority of basin farmers engaging in low-input, sustainable agriculture.

Strategy: The Department of Conservation lacks a survey system which will allow us to track the number of Fox River basin farmers who are using low-input, sustainable production methods. Because of this, and because we do not know if agricultural agencies can provide the data for evaluation, we must first:

- * Work with the National Center for Appropriate Technology, agricultural agencies, and the Department of Conservation's Biometrics Unit, Stream Unit, and Planning Section in order to develop an effective and efficient survey system.

Once a survey system is operational, we should begin educational efforts which will help us to approach the objectives, such as:

- * Educate ourselves and our audiences by reading and sharing information contained in the following sources:

- ATTRAnews, the newsletter of Appropriate Technology Transfer for Rural Areas which is funded by a grant from the U.S. Fish and Wildlife Service.

- project summaries of the USDA Sustainable Agriculture Research and Education Program, which include USDA project summaries and reports of the EPA-USDA "Agriculture in Concert with the Environment" (ACE) program (in Folio InfoBase format).

- * Prepare news releases for the Kahoka newspaper, "The Media," and the local SWCD newsletter which describe the economic and ecological advantages of low-input, sustainable crop production methods.

- * Seek invitations to speak to groups of landowners or business people about the potential benefits to streams of altering the prevailing approach to agriculture.

Objective 1.4: A majority of basin landowners who use acceptable methods for managing their riparian corridors.

Strategy: The Department of Conservation lacks a survey system which will allow us to track the number of Fox River basin farmers who are using acceptable methods for managing their riparian corridors. Because of this, we must first:

- * Work with agricultural agencies and the Department of Conservation's Biometrics Unit, Stream Unit, and Planning Section in order to develop an effective and efficient survey system.

Once a survey system is operational, we should begin educational efforts which will help us to approach the objective, such as:

- * Implement a Landowner Cooperative Project in Clark County if a suitable opportunity presents itself. LCP development will be dependent upon site accessibility, landowner attitude, and probability of successfully solving a problem by using biotechnical methods on a reach of stream which has unique habitat or supports unique or exploitable fish populations.

- * Prepare news releases for the Kahoka newspaper, "The Media," and the local SWCD newsletter which describe the economic and ecological advantages of stream corridor conservation.

- * Provide technical advice on stream management to all basin landowners who ask for help. Conduct on-site visits and follow up with written recommendations which facilitate action, but only in cases where the problem is approachable by using biotechnical methods and the

landowner seems likely to implement recommendations.

Objective 1.5: Maintenance of Fox River base flow at or above current levels within the constraints imposed by seasonal variation in precipitation.

Strategy: We will have to work closely with agricultural agencies in order to ensure that conflicting objectives do not send mixed messages and produce mixed results. In doing so, we should:

- * Encourage the Soil Conservation Service to use low-flow augmentation structures in any water retention structures (e.g., PL-566 impoundments) in upland portions of the watershed. Such structures may trap sediment and buffer the effects of high flow, but they can also reduce runoff in summer when basin streams need flow to maintain adequate depth and water quality.

- * Support development of a Missouri water law which would restrict irrigation projects on basin streams during times of low flow.

Objective 1.6: A Stream Corridor Plan developed and implemented for 2.5 miles of Fox River within the recently acquired Mark Twain National Wildlife Refuge.

Strategy: Such a plan must first be considered desirable by the U.S. Fish and Wildlife Service, who must also demonstrate a commitment to implementation. In order to determine this and begin the process, we should:

- * Share a copy of this Plan with the USFWS Refuge Manager, and seek a response which will indicate Federal commitment.

- * If USFWS desires MDC planning assistance, draft a Corridor Plan which involves implementation by USFWS and offers technical advice from MDC.

GOAL II: Maintain fish species richness at current level or greater while increasing the number of large sport fish which inhabit Fox River and its major tributaries throughout the year.

Perspective: In 1987, we added 16 species to the annotated list of fishes known to the Missouri portion of the Fox River basin, which now number 52. Five species reported by previous investigators eluded our gear in 1987: black buffalo, freckled madtom, walleye, Mississippi silvery minnow, and central mudminnow (no sample at Goose Pond). Most fishes in our 1987 samples were widespread, tolerant species. However, the intolerant slenderhead darter was surprisingly abundant; and slender madtoms, while limited to a couple areas, were indicative of satisfactory water quality. The absence of intolerant Mississippi silvery minnows in 1987 samples is cause for concern, as is the status of central mudminnows in the aftermath of the 1988 drought.

Our 1987 samples contained 540 channel catfish, of which 84% were sub-stock size (<11 inches). Only 18% of stock size and larger channel catfish were quality size (16 inches). We can only speculate why so few large channel catfish were captured, but we suspect that there is insufficient depth and current during much of the year to provide habitat suitable for quality-size

channel catfish; they may migrate downstream to the Mississippi River prior to the onset of low-flow conditions. Similar questions about downstream migration of adults exist for flathead catfish and smallmouth bass. Our 1987 survey yielded only 28 flathead catfish, most small; yet several anglers have reported catching big flatheads during high-flow periods in late spring and early summer. Of the 116 smallmouth bass captured in the Kahoka Hills area of Fox River, all were less than 9 inches long. Either recruitment to quality size is low or emigration to the Mississippi River is high.

We know virtually nothing about the migratory habits of quality-size sport fish in Fox River and other northeastern Missouri stream basins. Before we can manage these fisheries, we must know whether the exploitable stocks are stable or transient. Also, we must learn which methods and times of sampling will provide meaningful information. And it may be important to know if exploitable fish stocks in the Fox River basin contain tissue contaminants that might concern consumptive anglers; however, results of a contamination would be clouded by the unknown factor of fish movement into and out of the system. None of these information needs are specific to the Fox River basin; they exist for most tributaries to the upper Mississippi.

Objective 2.1: At least 50 native species of fish (common carp excluded) in basin streams or associated wetlands, including central mudminnow.

Strategy: We must assume that achieving basin habitat objectives will ensure maintenance of fish species richness. In order to know whether this objective has been achieved, three of the five species which were not collected in 1987 surveys must be found to still exist in the basin. This will require periodic surveys, with some effort directed toward capturing species not common within the basin. It will also require protection of existing central mudminnow habitat and location of additional waters suitable for mudminnows. Our approach should be:

- * Conduct fish population surveys at ten-year intervals at ten randomly selected 1987 sample sites and additional sites thought to harbor species not common within the basin.
- * With permission from the current landowner, determine current status of central mudminnows in Goose Pond. If central mudminnows are still present, purchase the property (approximately 320 acres in S32/33, T65N, R6W and S4/5, T64N, R6W); manage primarily for central mudminnows.
- * Seek one additional wetland area where central mudminnows may thrive; purchase the property and introduce central mudminnows from the assumed Goose Pond population.

Objective 2.2: Balanced populations of channel catfish and flathead catfish, and a balanced fish community (conditions not yet defined for warmwater streams).

Strategy: We must establish fish population and community parameters which reflect a desired state of balance, but cannot do so until we learn more about sport fish migration patterns and seasonal variability in fish population survey results. In order to empower managers with the methods they need to set measurable objectives, we must first:

- * Initiate the process of determining the degree to which quality-size channel catfish and flathead

catfish migrate between the Fox River and the upper Mississippi River by proposing that the Fisheries Research Section conduct a broad investigation of catfish movement between the upper Mississippi River and its major tributaries.

* Initiate the process of determining satisfactory times, locations, and methods for assessing the status of exploitable fish stocks in the Fox River basin by proposing that the Fisheries Research Section conduct a broad investigation that will lead to efficient and reliable methods for assessing exploitable fish stocks (primarily channel and flathead catfish) in prairie streams. If results from these prerequisite investigations satisfy our need for information, we should amend this plan by adding parameter-based objectives which define specifically what we mean by balanced catfish populations and a balanced stream fish community. Regulatory strategies for achieving balance should be thoroughly considered at that time.

GOAL III: Increase appreciation for the accessibility to streams within the Fox River Basin which are capable of supporting more recreational use without degradation of unique habitats or native fish populations.

Perspective: Relative to other stream basins in northeastern Missouri, Fox River receives very little attention by anglers or floaters. Boating and canoeing on all tributaries and most of Fox River is hampered by shallow water, log jams, and low base flow. Over two-thirds of Fox River anglers prefer to fish for channel catfish over other species, probably from shore or by wading. Public areas containing a total of 10 miles of stream frontage in the basin. Charlie Heath State Forest alone includes 3.9 miles of wadable, fishable Fox River. Gann (1989) identified two additional sites within the basin for stream access development. Goede Access on Fox River was developed in 1989. The second site would provide access to Fox River upstream of its confluence with Little Fox River approximately 2.5 miles north of Kahoka.

Even though recreational use of basin streams seems low relative to the availability of public stream frontage, there are some unique habitats which might be enjoyed if they are accessible. A 15-mile reach of Fox River from Missouri State Highway 81 to U.S. Highway 136 has been classified as a "significant aquatic area."

Within this reach, a one-acre natural prairie at the Waterloo Cemetery would be an interesting site near a potential access at a county road just downstream from the mouth of Ramsey Branch. Locating an access at this point would allow floaters to travel past a very large geode deposit and a natural rock bridge on their way to Goede Access, and might therefore be more desirable than the second site identified by Gann.

Other sites which may be worth considering for public ownership include frontage to Honey Creek somewhere between Missouri State Highway 81 and 61, and frontage to Fox River in the vicinity of Chambersburg. The Honey Creek segment is characterized by steep wooded bluffs, limestone outcrops, rocky streambed, relatively clear water, and high fish species richness. The Chambersburg site on Fox River is characterized by large bedrock outcroppings with expansive bedrock pools separated by short cobble and rubble riffles, leading to high fish species richness.

Objective 3.1: Public access to the most unique and scenic reaches of basin streams.

Strategy: We should propose modification of the Department of Conservation's Stream Areas Acquisition Plan (Gann 1989) to reflect current knowledge of opportunities for public use and appreciation. Our proposal should include recommendations to:

- * Replace the currently proposed access on Fox River at S2, T8W, T65N with a proposed access near the Waterloo Cemetery at S9, R7W, T65N.
- * Purchase additional stream frontage on Honey Creek between Missouri State Highway 81 and 61, and on the Fox River near Chambersburg (S9, R8W, T60N).

Objective 3.2: All potential stream anglers and floaters having access to information and an appreciation for stream recreational opportunities within the Fox River basin.

Strategy: We assume that not all potential anglers and floaters of Fox River basin streams know about existing recreational opportunities. Publicity should increase use and appreciation of these resources without risk of degradation, and it may help to create private sector advocates for basin streams. In order to effectively disseminate information, we should:

- * Develop an attractive brochure which describes points of access and interest along basin streams and provides information on fishing and floating. We should schedule publication to occur when most anticipated public access acquisition and development is completed.
- * Make classroom presentations on stream conservation to Clark County sixth graders, including information on points of interest in the Fox River basin.
- * Facilitate the development and activity of Stream Teams or other groups interested in adopting or otherwise promoting stewardship and enjoyment of basin streams.